

1. Find the Laplace transfer of following functions

- a. $f(t)=6t^4$
- b. $f(t)=\sin 2t+\cos t$
- c. $f(t)=e^{-3t}\sin 2t$
- d. $g(t)=5+t^2+e^{5t}$
- e. $h(t)=\frac{d}{dt}(te^{-5t})$

2. Find the roots of following polynomials

- a. $F(t)=2t^2+t-1$
- b. $G(z)=z^8-1$
- c. $K(m)=m^3+9m^2+23m+15$

3. Calculate the following

$$M = \begin{bmatrix} 1 & 3 \\ 1 & 1 \end{bmatrix} \quad T = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix} \quad K = \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$$

- a. $\text{Det}(M)$
- b. T'
- c. $M*T$
- d. $3*M*T'$
- e. $M+T'$
- f. $T*T+K'$
- g. K^{-1}

4. Convert following into matrix form and solve

$$9x+3y+5z=30$$

$$x-5y+z=-6$$

$$x+y+z=6$$